

REMARKS

Applicant respectfully requests reconsideration of this application, and reconsideration of the Office Action dated September 3, 2003 (Paper No. 8). Upon entry of this Amendment, claims 2-4, 7, 9-20 will remain pending in this application with claims 13-20 currently withdrawn from consideration. Claims 1, 5, 6, and 8 are cancelled and new claims 21-25 are added. The amendments to the claims and the newly added claims are supported by the specification and original claims. No new matter is incorporated by this Amendment. Payment to cover the fee associated with the newly added claims is submitted herewith.

Applicant affirms the election of Group I. Applicant reserves the right to prosecute the subject matter of any non-elected claim in a subsequent divisional application.

Applicant also wishes to thank the Examiner for correcting the typographical error on page 5, line 4 of the specification.

* * * * *

Claim 6 was rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Claim 6 has been cancelled by this Amendment thereby rendering the rejection moot.

* * *

Claim 7 is rejected under 35 U.S.C. § 102(b) as purportedly anticipated by Morikawa et al. (U.S. Pat. No. 5,911,257). Applicant respectfully traverses.

Independent claim 7 concerns a substrate cleaning apparatus. The cleaning apparatus includes a first scrub head that locates over the substrate held by the substrate holder, and moves horizontally relative to the substrate, and a second scrub head that locates over the substrate together with the first scrub head, and moves horizontally relative to the substrate such that the second scrub head follows the first scrub head. The

first and second scrub heads are said to be different at least in material or structure. According to Applicant's invention, both scrub heads are concurrently located over the substrate during the cleaning operation and one scrub head follows the other scrub head. In other words, the two scrub heads cooperate with each other to perform an effective cleaning operation.

Morikawa discloses a device that employs two scrub heads and teaches that the two scrub heads are concurrently used for cleaning a bonding plate. However, in Morikawa, the second head is used exclusively for cleaning the peripheral portion of the bonding plate. Thus, the second head does not follow the first head. Moreover, Morikawa's device is for cleaning a bonding plate that holds a substrate and not a substrate (i.e. semiconductor wafer). Accordingly, for at least these reasons, Morikawa fails to teach or fairly describe each and every feature of claim 7 and thus cannot anticipate claim 7.

The above remarks overcome this rejection. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

* * *

Claim 2 is rejected under 35 U.S.C. § 102(e) as purportedly anticipated by Yeo (U.S. Pat. No. 6,543,079). Applicant respectfully traverses.

Independent claim 2 also concerns a substrate cleaning apparatus. The cleaning apparatus of claim 2 includes a first scrub head that locates over the substrate, positions at a first height where the first scrub head substantially contacts the substrate during a cleaning operation, and moves horizontally relative to the substrate. In addition, the apparatus of claim 2 includes a second scrub head that locates over the substrate together with the first scrub head, positions at a second height where the second scrub head contacts the substrate via a liquid film formed on the substrate, and moves horizontally

relative to the substrate such the second scrub head follows the first scrub head.

According to Applicant's invention, both scrub heads are concurrently located over the substrate at different heights.

Yeo discloses a wafer cleaning apparatus that has two arms, with each arm being provided with a brush. Each arm moves its respective brush across the surface of the wafer at a different height. However, Yeo neither teaches nor fairly suggests that the two brushes are concurrently used. Yeo teaches that when one brush is operated, the other brush is held at a standby position. See Column 6, Lines 1-12. Yeo, for example, teaches using one brush for cleaning wafers having an oxide layer, and the other brush for cleaning wafers having a metal layer. Yeo's apparatus seeks to combine brushes from two different apparatuses (i.e. one that cleans metal layered wafers and another that cleans oxide layered wafers) into one apparatus. Accordingly, the brushes employed in Yeo's apparatus cannot be used at the same time. This is completely different from Applicant's invention wherein both scrub heads are concurrently located over the substrate at different heights. Hence, Yeo fails to teach or fairly suggest each and every feature of independent claim 2 and thus cannot anticipate the claimed invention.

The above remarks overcome this rejection also. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

* * *

Claims 4, 5, 7, 8, and 10 are rejected under 35 U.S.C. § 102(b) as purportedly anticipated by Sugimoto et al. (U.S. Pat. No. 5,647,083). The Office Action asserts that Sugimoto describes each feature of these claims. Applicant notes that claims 5 and 8 are cancelled. Moreover, Applicant respectfully traverses.

Independent claim 7 (from which claim 10 depends) has been described above. Claim 4 also concerns a substrate cleaning apparatus. The cleaning apparatus of claim 4

includes a first scrub head that locates over the substrate held by the substrate holder, and moves horizontally relative to the substrate, and a second scrub head that locates over the substrate together with the first scrub head, and moves horizontally relative to the substrate such that the second scrub head follows the first scrub head.

Sugimoto discloses a cleaning apparatus that employs brushes of different types. However, unlike in Applicant's apparatus, in Sugimoto apparatus, two or more brushes cannot be used simultaneously. In other words, in Sugimoto's apparatus, only one of the brushes is selectively used at a time. Sugimoto neither teaches nor fairly suggests an apparatus having two brushes wherein one scrub head follows the other scrub head, and the two scrub heads cooperate with each other to perform an effective cleaning operation.

The above remarks overcome this rejection also. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

* * *

Claims 1, 6, and 9 are rejected under 35 U.S.C. 103(a) as obvious based on Sugimoto et al. in view of Choffat et al. (U.S. Pat. No. 5,870,793). Applicant notes claims 1 and 6 are cancelled.

Claim 3 is rejected under 35 U.S.C. 103(a) as obvious based on Yeo in view of Choffat et al.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as obvious based on Sugimoto et al.

These three rejections are addressed together as similar issues apply to all three. Moreover, Applicant also traverse these rejections.

The deficiencies of Sugimoto and Yeo are discussed above. Choffat fails to remedy these deficiencies. Choffat merely discloses a specific head structure. However, Choffat, like Sugimoto and Yeo, fails to teach or fairly suggest an apparatus having two

brushes wherein one scrub head follows the other scrub head, and the two scrub heads cooperate with each other to perform an effective cleaning operation. Moreover, there is nothing in the teachings of the cited art which provides the requisite motivation to those of ordinary skill to modify the combined teaching of such art and arrive at the claimed invention.

Accordingly, in view of the above remarks, all three rejections are overcome. Reconsideration and withdrawal of each rejection are respectfully requested.

* * * * *

Applicants respectfully submit that this Amendment and the above remarks obviate the outstanding rejections in this case, thereby placing the application in condition for immediate allowance. Allowance of this application is earnestly solicited.

If any fees under 37 C.F.R. §§1.16 or 1.17 are due in connection with this filing, please charge the fees to Deposit Account No. 02-4300; Order No. 033082.100.

If an extension of time under 37 C.F.R. § 1.136 is necessary that is not accounted for in the papers filed herewith, such an extension is requested. The extension fee should be charged to Deposit Account No. 02-4300; Order No. 033082.100.

Respectfully submitted,
SMITH, GAMBRELL & RUSSELL, LLP

By:



Michael A. Makuch, Reg. No. 32,263
1850 M Street, N.W., Suite 800
Washington, D.C. 20036
Telephone: (202)263-4300
Facsimile: (202) 263-4329

Dated: March 3, 2004
MAM/BLN